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INTERNET ServicesMONDAY
WK 04 DAY 020-345

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NETWORK FUNCTIONS

- A computer NW means interconnected collection of autonomous computers.
- A collection of interconnected computers & facilities that provides transfer of information between users located at various geographical points.
- **Objectives of NW:**
 - ① **CONNECTIVITY:** should be there to provide interconnection with each other.
 - ② **SIMPLICITY:** should be there to permit all operations properly.
 - ③ **MODULARITY:** dividing whole NW into modules gives easy installation & easy to debug error and work properly.
 - ④ **RELIABILITY:** achieved with the help of backup & redundancy. It helps in error detection & correction.
"Reliability means errors in one area should not affect others".
 - ⑤ **FLEXIBILITY:** modification can be done easily to adopt new technology and for future expansion.

JANUARY 2014

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TUESDAY

WK 04 DAY 021-344

- ⑥ **DIVERSITY:** It means diff. kinds of services are available on NW for user to use without knowing for implementation of NW.
- ⑦ **SECURITY:** Should be there to avoid unauthorized access.

- **Applications/Uses of NW:** A major goal of NW is to provide resource sharing & to provide reliable, low cost facilities & easy addition of new processing services.
- Sharing of distant resources.
- Interprocess communication
- Reliability of NW
- Distribution of processing function
- Centralized management & allocation of NW resources
- ⑥ Efficient means of transporting large volume of data
- ⑦ Flexible working environment.

Network for companies:

- Resource sharing
- high reliability
- saving money
- high scalability
- powerful communication

Success is the sum of small efforts, repeated day in and day out.

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→ Connection b/w computing devices JANUARY 2014
can be wired or wireless using radio waves
or infrared signals.

WEDNESDAY

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WK 04 DAY 022-343

Data Transfer rate (Bandwidth):- The speed at which data is moved from one place to another.
Network for People: moved from one place to another

- access to remote information
- person to person communication
- interactive environment.

► NETWORK AND SERVICES :

① Radio & Television Broadcasting -

Most common communication service. Various stations transmit signals simultaneously over radio or cable distribution NW.

Aside from selecting the station of interest, the role of user in these services is passive. Relatively high audio & video quality is expected ; but a significant amount of delay can be tolerated.

② Telephone Service -

Most common real-time service provided by a NW. Two persons are able to communicate by transmitting their voices across the NW. This service is "connection-oriented" means users must first interact with the NW to setup a connection. There should be high degree of availability, security & privacy.

Water continually dropping will wear hard rocks hollow.

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THURSDAY

WK 04 DAY 023-342

(3) Cellular telephone Service :

Extends normal telephone service to mobile users who are free to move within a regional area covered by an interconnected array of smaller geographical areas called CELLS. Each cell has a radio transmission system that allows it to communicate with users in its area. It provides lower voice quality & lower availability. Some cellular providers support a roaming service where a subscriber is able to place calls while visiting regional areas other than the subscribers home base.

(4) Electronic Mail :

User typically provides a text msg & a name or address to a mail application. The application interacts with a local mail server which in turn transmits the msg to destination server across a comm. NW. The destination user retrieves the msg by using a mail application. E-mail is not real-time & not necessarily connection-oriented.

(5) Video on Demand:

Success usually comes to those who are too busy to be looking for it.

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WK 04 DAY 024-341

FRIDAY

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FUNCTIONS OF A NW :

The essential func' of a NW is to transfer information between a source & destination. The functions that a NW must provide:

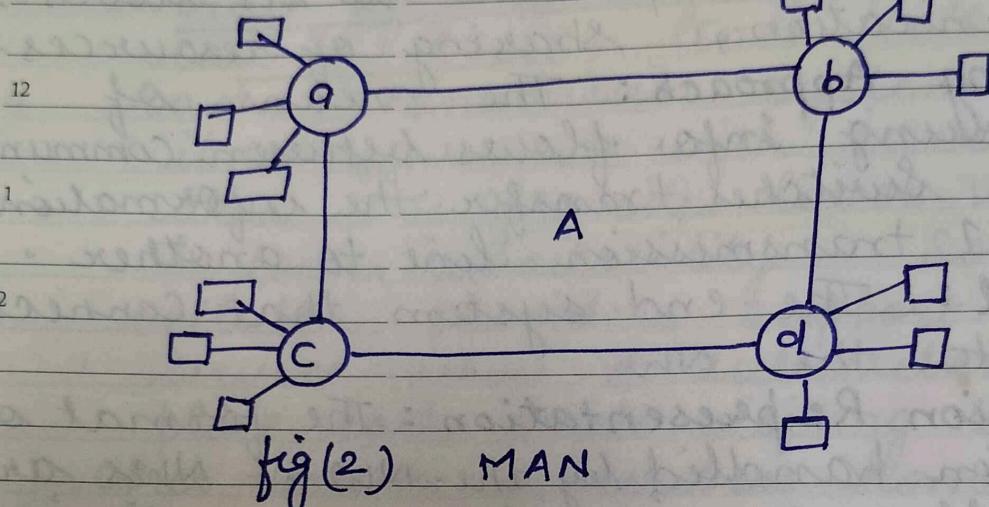
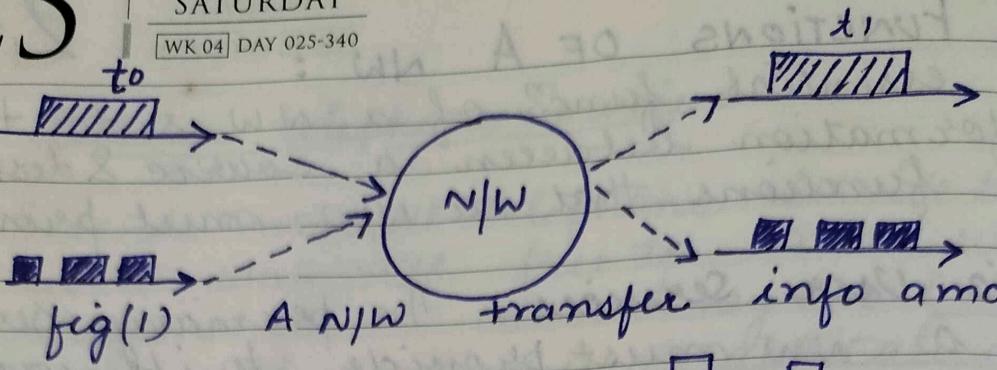
1. Basic User Services: The primary service that a NW must provide to its users is communication, sharing of resources.
2. Switching Approach: The means of transferring info. flows between communication lines. Switches transfer the information from 1 transmission line to another.
3. Terminal: The end system that connects to the NW
4. Information Representation: The format of the information handled by the NW. NWs are typically designed to carry specific types of information representation.
eg. analog voice signals, bits or characters.
5. Transmission system: The means for transmitting info across a physical medium. eg. waves, cables, radio, optical fibre.
6. Addressing: The means for identifying points of connection to the NW.
Addressing is required to identify which NW input is to be connected to which NW output.

JANUARY 2014

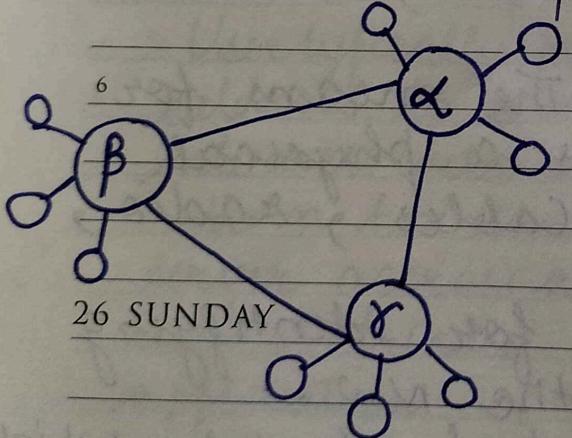
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SATURDAY

WK 04 DAY 025-340



7. Routing : The means for determining the path across the NW.



α. A.a.1 → The use of hierarchical addressing facilities for task of routing

Success seems to be largely a matter of hanging on after others have let go.

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MONDAY

WK 05 DAY 027-338

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8. Multiplexing: The means for connecting multiple information flows into shared connection lines.

9. Traffic Control: To ensure smooth flow of information through the NW. In addition, when congestion occurs inside the NW as a result of a surge in traffic or a fault in equipment, the NW should react by applying congestion or overload control.

10. Network Management: Includes monitoring the performance of the NW, detecting & recovering from faults, configuring the NW resources & providing security by controlling access to the information that flows in the Network.

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TUESDAY

WK 05 DAY 028-337

NETWORK TOPOLOGY:

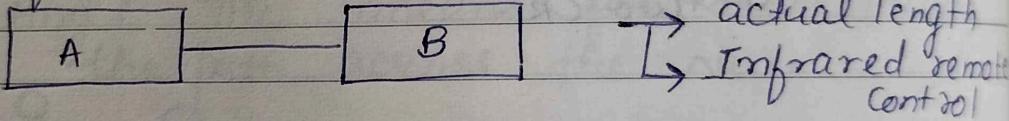
- → means physical structure in which all components of NW are connected
- desc. the method used to do the physical wiring of NW
- also indicates how many devices can be connected.

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Two types of connection are:

- 1) Point - to - point
- 2) Multipoint.

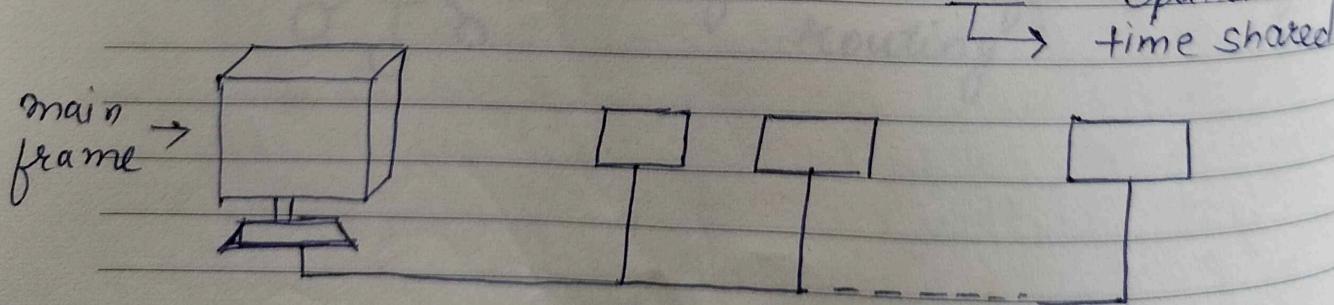
Point - to - Point Connection: Direct link is used b/w two devices in dedicated way to transfer. It uses entire capacity of transmission media to transfer.



Multipoint: links 3 or more devices.

Generally, it uses one master computer & a series of slave terminals. All terminals share bandwidth of transmission media.

→ Spatial
time shared



One's best success comes after their greatest disappointments.

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WEDNESDAY
WK 05 DAY 029-336

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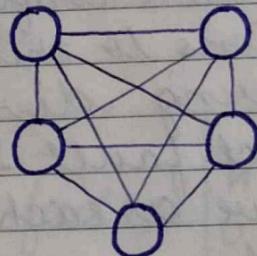
Properties Considered for Selecting Topology:

1. Ease of installation
2. Ease of configuration
3. Ease of troubleshoot
4. No. of units affected in case of media failure.

Types of topology:

1. Mesh
2. Star
3. Tree
4. Bus
5. Ring
6. Cellular

① Mesh Topology : have dedicated point-to-point link between devices. A fully connected mesh NW has $n(n-1)$ physical channels to connect ' n ' devices. Every device has $(n-1)$ I/O ports.



Advantages:

- high speed
- eliminates traffic problem
- Its robust means not prone to crash
- Privacy is maintained
- Fault identification is easy

Disadvantages:

- costly
 - too much requirement of I/O ports & cabling.
 - difficult installation & reconfiguration
- It's always wise to look ahead, but difficult to look farther than you can see.

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THURSDAY

WK 05 DAY 030-335

JANUARY						
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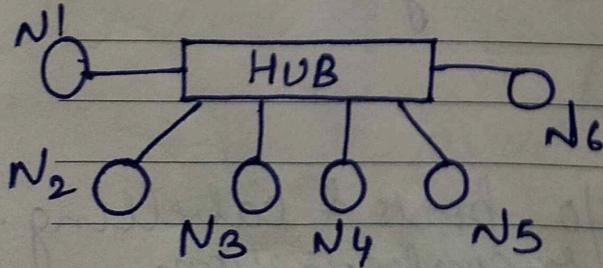
- ② Star Topology: is designed with each node connected directly to a centrally located device or hub. Hub is a special kind of repeater that overcomes the electromechanical limitations of media.
- Data passes through hub before continuing to its destination. The hub manages/ controls all functions of a NW. It also acts as a repeater for data flow.
- Hub resends message to Computer.

1) Broadcasting: When hub transfers data to all

2) Unicasting: When hub transfers data to single node.

Advantages:

- Easy to install & configure
- No disruptions to the NW when connecting/ removing devices.
- Easy to detect fault & remove faults
- less expensive as each device needs 1 link & 1 port
- A computer failure doesn't affect whole NW
- Ordinary telephone cables, UTP, STP can be used.



The dictionary is the only place where success comes before work.

4

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FRIDAY
WK 05 DAY 031-334

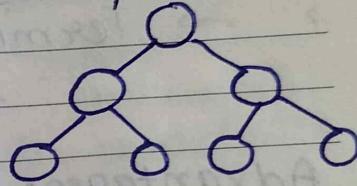
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Disadvantages:

- failure of hub brings entire NW down
- More cabling is required than ring/bus
- Slower than Mesh.

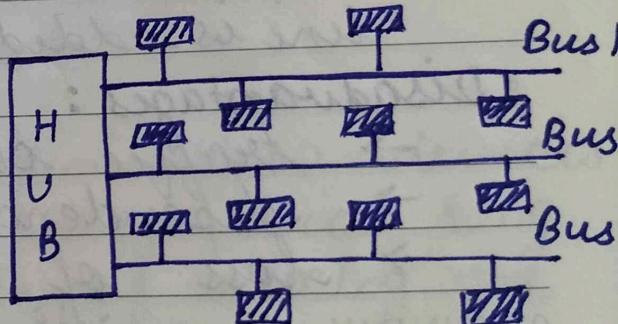
③ Tree Topology: (HYBRID TOPOLOGY)

combines the characteristics of linear bus & star topology. It is similar to star NW that nodes are connected to the secondary hub that inturn connected to central hub. Central hub behaves as active or passive hub.

Advantages:

- Point to point cabling for individual segments
- Supported by several HW and SW vendors

or

Disadvantages:

- If central hub fails, entire segment goes down

- More difficult to configure & wire.

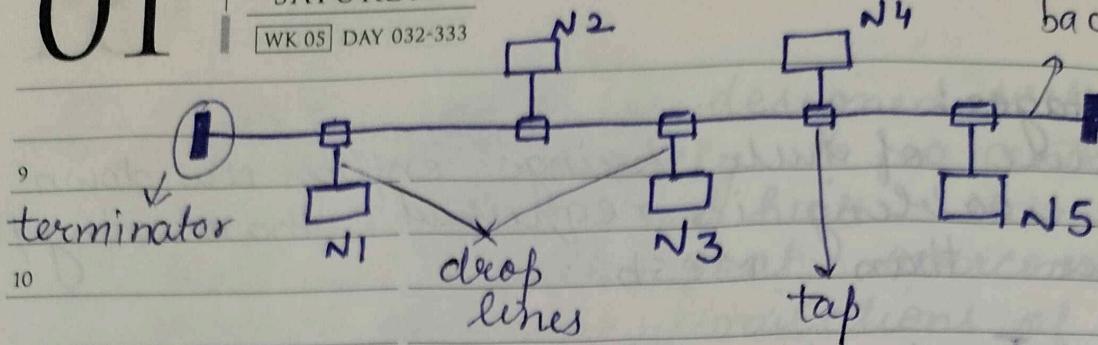
④ Bus topology: A long cable is used as a link or backbone to connect all devices.

That some achieve great success is proof to all that others can achieve it as well.

01

SATURDAY

WK 05 DAY 032-333



- A drop line is a cable running between device & main cable.
- A signal becomes weak when it travels in main cable so there is a limited no. of devices that can be connected to backbone.
- Terminators absorb electrical energy & stop reflections.

Advantages:

- reliable, simple, easy to use
- easy to install, cheaper than others
- less labelling is used bcz each drop line is added to nearest point to cable.

Disadvantages:

- traffic conjunction
 - dependency on main cable
 - loss of information
- 02 SUNDAY → difficult fault isolation.

⑤ Ring Topology: Each device has dedicated point to point line configuration only with 2 devices on either side of it.

⑥

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MONDAY

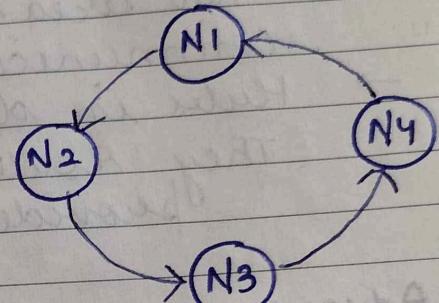
WK 06 DAY 034-331

03

→ The communication is only 1 directional until info. reaches to destination. When the device receives the signal intended for other node. It simply regenerates the bits & passes them along. Ring NW passes a token (A short message with the electronic address of receiver)

Advantages:

- easy to install & configure
- adding & deleting new devices is easy
- no loss of information bcz token is regenerated at each node
- no terminators are required.



Disadvantages:

- A break in ring stops entire transmission
- difficult to troubleshoot

2-way ring: Two connections b/w 2 devices gives high reliability. Using dual ring NW or a switch capable of closing the break can solve the problem.

⑥ Cellular Topology:

Used in application of wireless media that not require any kind of cable connection.

"I can't do it" never yet accomplished anything; "I will try" has performed well.

FEBRUARY 2014

FEBRUARY

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04

TUESDAY

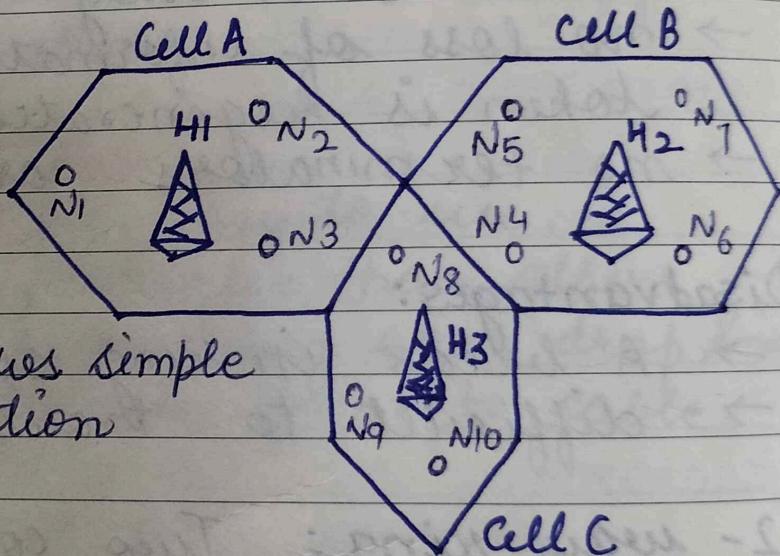
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→ Total area is divided into a no. of small areas, each area called CELL.

→ In wireless media, each point transmits in a certain geographical area called a cell. Each cell represents a portion of the total NW area. Devices that are in the cell communicate through a central hub. → Hubs in diff cells are interconnected. They route data across the NW and provide a complete NW.

Advantages:

- troubleshooting is easy
- hub to hub fault tracking is more difficult but allows simple fault identification



Disadvantages:

- If central hub fails all nodes in that range are affected.